View metadata, citation and similar papers at core.ac.uk
brought to you by CORE
provided by European Online Journal of Natural and Social Sciences

European Online Journal of Natural and Social Sciences 2015;
Vol.4, No.2 pp. 336-350
ISSN 1805-3602
www.european-science.com

Farmers' Behavior toward Membership in Water User Associations (WUAs) in Iran: Applying the Theory of Planned Behavior

Milad Taqipour, Enayat Abbasi*, Mohammad Chizari
Department of Agricultural Extension and Education, Tarbiat Modares University
*E-mail: Enayatabbasi@gmail.com; Tel.:+982148292071

Received for publication: 01 December 2014.
Accepted for publication: 02 May 2015.

Abstract

In many countries today, irrigation systems have been transferred to the water users associations. This study aimed at analyzing farmers' behavior toward membership in water users associations based on the theory of planned behavior. This research was designed as a descriptive-correlation survey. All farmers from the two villages, Lishter and Kheir Abad, the city of Gachsaran, Iran, who were under the cover of Lishter irrigation and drainage network (N=572) formed the population for this study. Using Krejcie and Morgan's (1970) table and a proportional stratified random sampling technique 230 farmers were selected (n=230) from the population. The main research tool was a questionnaire. The validity of the questionnaire was confirmed by a panel of experts of faculty members of Agricultural Extension and Education at Tarbiat-Modares University and Rural Development department at Yasuj University. The reliability of the questionnaire was calculated at pre-test stage for different parts of the questionnaire ranging from 0.650-0.922. The collected data were analyzed using SPSS 19 software. Results revealed that two variables, tendency and perceived behavioral control, had direct and meaningful effect on the farmers' behavior for membership in water users associations. The variables of tendency and subjective norms had the most direct and indirect effect on the farmer's behavior, respectively. In sum, tendency, perceived behavioral control and subjective norms had the causal effect on the farmers' behavior toward membership in water users associations.

Keywords: Behavior, Path Analysis, Subjective Norms, Tendency, Theory of Planned Behavior, Water Users Association.

Introduction

Water plays a crucial role in human life and agriculture. However, water resources are becoming scarcer around the world, imposing a problem for development of agriculture sector that needs more water resources. About two thirds of irrigated farms are located in developing countries, where irrigated farming is the main source of producing food. However, the average irrigation efficiency in these countries is only 38 percent (Vermillion and Sagardoy, 1999). This means that despite the limitation and unsuitable distribution of water resources, unfortunately the efficiency of using water is at low level (Afshar and Zarafshani, 2010). One of the main problems inflicting countries in arid and semi-arid areas is the insufficiency of water for different uses like drinking, industrial, and agriculture use.

In Iran, statistics show that the agricultural section is the biggest water user with a usage level of 92 percent of the 93.1 billion cube meters of extracted water. In this regard, using mechanisms to improve water usage management and conservation of the current and future drainage and irrigation systems is obvious (Norouzi, 2005). Physical development of irrigation channels without paying attention to the role of local users and their participation in planning and

decision-making, delivering and using processes has resulted in decreased water efficiency of less than 30 percent and the exhaustion of irrigation channels (Ehsani and Khaledi, 2003).

Lack of participation of water users in the decision-making, management, and maintenance of irrigation channels is the main reason of low level of water efficiency in developing countries (Omid *et al*., 2012), like Iran. The participation policy of water users in water management has increasingly come to attention since the 1980s due to the incapability of governmental organizations in proper management of water and related funds (Vermillion and Sagardoy, 1999). As Meinzen-Dick and Pradhan, 2001 mentioned local water user associations play an important role in water resource management, and in many countries their role has been strengthened in recent years by decentralization and devolution (Berger *et al*., 2007).

A trend of transferring water management from government to the private sector has been increasing all over the world, and this has turned into a national policy in many countries in Asia, Africa, and Latin America (Hayati *et al*., 2010).

Chile has played a pioneering role in water policy reform by privatizing water rights and promoting trade in such rights, devolving irrigation management authority to user groups, and privatizing the provision of irrigation infrastructure (Berger *et al*., 2007). In China, during the past decade, reform-oriented institutions, such as Water Users Associations (WUAs) and contracting, have largely replaced the traditional institution of collective management in village level irrigation systems (Huang *et al*., 2010). In Mongolia, WUAs have been promoted to solve water supply problems, promote efficient water use, and alleviate rural poverty (Qiao *et al*., 2009). In Kyrgyzstan, the rate of establishing WUAs increased from 1997. In 1997, the Government passed a bill that encouraged the establishment of WUAs. This bill was upgraded into a law in 2002, which provided the basis for established WUAs to take over on-farm irrigation water management and infrastructure development (Kazbekov *et al*., 2009). In Turkey, the efforts carried out to promote the farmers participation in the construction and management of the irrigation systems dates back to 1960s. Starting from the 1st Five Year Development Plan (1963–1967), the subject has been dealt with in many plans (Uysal and Atis, 2010). In Iran, such associations have been emphasized by various governmental organizations, such as Force Ministry, Cooperative, Labor and Social Welfare Ministry and Jihad-e Keshavarzi Ministry. There are 326 WUAs in different provinces of Iran (Ministry of cooperative, labor and social welfare, 2001). Comparing different provinces, east Azerbaijan province with 96 WUAs is in first rank and Bushehr, Zanjan, Hormozgan, Tehran, Chaharmahal and Bakhtiari, and Kohgiluyeh and Boyer Ahmad provinces with one WUA are ranked last. Despite the high potential in Kohgiluyeh and Boyer Ahmad province (a south-west province of Iran), with presence of dams, irrigation and drainage networks and fertile lands, there is only one WUA in whole province. This research explores possibilities for establishing these kinds of associations in this province.

The aim of establishing WUAs is to create the necessary situations for farmers to participate in the decision making process for efficient management of water resources (Afshar and Zarafshani, 2010). These associations are established based on organizing the users within a legal framework so that they might control the construction, development, reconstruction, and maintenance of irrigation channels (Ghalavand, 2006).

Individual's behavior is heavily influenced by their tendency. On the other hand, an individual's tendency toward participatory behavior depends on certain prerequisites. Therefore, the analysis of farmers' behavior under various circumstances becomes highly important (Afshar and Zarafshani, 2010).

Although establishing WUAs plays a very important role in different countries (Berger *et al*., 2007; Huang *et al*., 2010; Qiao *et al*., 2009; Kazbekov *et al*., 2009; Uysal and Atis, 2010; Awan *et*

al., 2011), we have little knowledge how it applies in Iran. To fill this gap, we have focused on of the southwest provinces of Iran. Therefore, we investigated the perception of farmers regarding the establishing WUAs. The findings of this research can guide both the Ministry of Energy as well as Agriculture to be aware of the requirements for establishing WUAs. The results of this study will also help Agricultural Extension Organization to develop and deliver sound educational programs for encouraging membership in the WUAs.

Theoretical Framework

The formation of behavior and attitude depends on personal, cognitive, and emotional experiences of an individual. Various behavioral theories have tried to justify people's behavior and activities in certain situations. One of them is Ajzen's Theory of Planned Behavior (TPB), which is the basis for this study. TPB has been proposed for predicting and recognizing individual's activities and behavioral causes (Ajzen and Fishbein, 1980). The main hypothesis of the theory is that behavior is directly determined by an individual's tendencies. In other words, an individual's tendencies form the direct predictors of behavior. Individuals' tendencies depend on variables such as attitude toward behavior (positive or negative evaluation of behavior), subjective norms (perceived social forces to show or not to show a behavior), and perceived behavioral control (the perception of the difficulty or ease of a favorable behavior, a concept that is close to self-confidence). Figure 1 shows the main indexes of TPB.

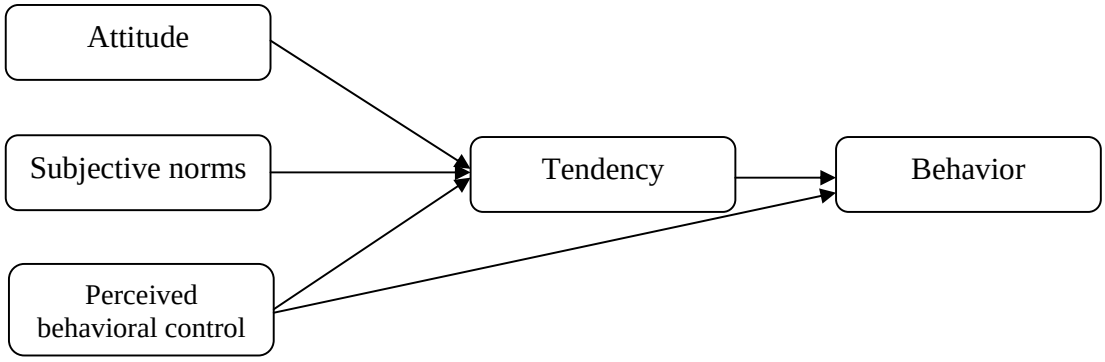

Figure 1. The Theory of planned behavior (Ajzen, 2006)

Attitude toward behavior is a positive or negative evaluation of a particular behavior, which is influenced by the outcomes of an individual's behavior. Subjective norms are an individual's perceptions of social forces regarding a particular behavior, which is influenced by others, influence on an individual with regard to that behavior. Perceived behavioral control is related to an individual's perception of self-efficacy in performing a behavior, which is influenced by the behavior's difficulty (Abbasi and Akbari, 2011).

The theory of planned behavior has a wide range of applications. Bamberg (2002) believes the model to be one of the most commonly used models in social psychology. The theory is appropriate for planning various behaviors such as those in leisure time (Ajzen and Driver, 1992; Ajzen, 1991), education (Ingram et al., 2000), commerce (Chiou, 2000; Bamberg, 2002; Fortin, 2000), and agriculture and natural resources (Beedell and Rehman, 2000; Habeeb *et al*., 1987; Pouta and Rekola, 2001; Karppinen, 2005; Hattam, 2006; Karami and Mansoorabadi, 2007; Rehman *et al*., 2007; Abbasi and Akbari, 2011).

A review of studies shows that awareness, in addition to the variables introduced by Ajzen, is also an important variable that influences an individual's tendency and behavior indirectly via the attitude, subjective norms, and perceived behavioral control (Lajunen and Rasanen, 2004; Solhi *et al*., 2012; Ghaemi *et al*., 2008; Khedri, 2006). In this research, awareness means a farmer's knowledge of main principles of cooperation and WUAs. Furthermore, it is also hypothesized that, in addition to its direct effect, subjective norms influences tendency indirectly via attitude and perceived behavioral control (Figure 2).

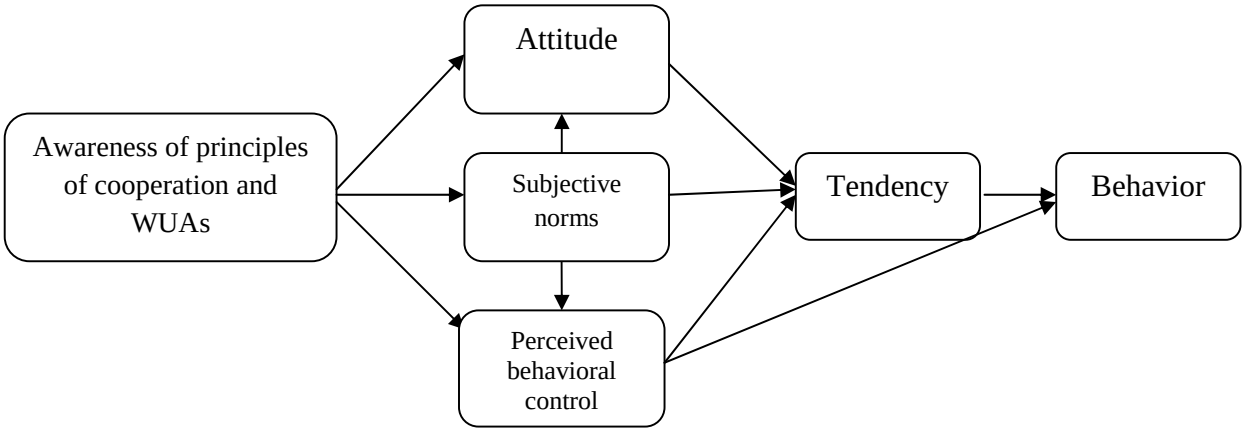

Figure 2. Conceptual framework of the research (adapted from Ajzen, 2006)

In this context, the present study aimed to analyze the behavior of farmers of Lishter and Kheir Abad basin in Kohgiluyeh and Boyer Ahmad province towards establishing WUAs.

Hypotheses

The main hypotheses derived from the conceptual framework are:

1. Awareness of the principles of cooperation and WUAs has a positive and significant impact on farmers' attitude, subjective norms and perceived behavioral control.
2. Attitude, subjective norms, and perceived behavioral control have a positive and significant impact on farmer's tendency toward membership in WUAs.
3. Subjective norms have a positive and significant impact on farmers' attitude, and perceived behavioral control.
4. Perceived behavioral control and tendency have a positive and significant impact on farmers' behavior toward membership in WUAs.

Materials and methods

This research is a quantitative study that employed a causal-comparative research design. The populations for the study were all 572 famers from Lishter and Kheir Abad plain in Gachsaran County, Kohgiluyeh and Boyer Ahmad province, a southwest province in Iran. Using Krejcie and Morgan's (1970) table and proportional stratified random sampling technique, 230 farmers were selected as research sample. Out of them, 219 farmers answered questions in the interview schedule via face-to-face interviews to a return rate of 95.21%.

One section of the questionnaire contained general demographic of the respondents such as age and educational level. The next section was designed to describe farmers' attitudes toward membership in WUAs (10 items), subjective norms (7 items), perceived behavioral control (10 items), tendency (7 items) and behavior (2 items). Items were rated on a five point Likert-type scale (strongly Agree= 5, Agree=4, Uncertain=3, Disagree=2, strongly Disagree=1). Seven items were

designed to identify farmers' awareness of cooperation and WUAs principles, which were rated on a five-point continuum of "Very High=5", "High=4", "Average=3", "Low=2" and "Very Low=1" options.

Table 1. Variables, definitions, items and Level of Alpha Coefficients

Variables	Definition	Sample item	total number of items	α
Attitude	Positive or negative evaluation of behavior Whether the person is in favor of doing something	Membership in water user associations is effective in protecting and strengthening water resources of the region Membership in water user associations reduces production costs	10	0.733
Subjective norms	Perceived social forces to show or not to show a behavior How much the person feels social pressure to do something	Acquaintances emphasize becoming a member of water user associations for reducing production costs Ideas of my family, friends and other people about this issue are important for me	7	0.705
Perceived behavioral control	The perception of the difficulty or ease of a favorable behavior, a concept that is close to self-confidence	Financial issues usually prevent me from becoming a member of water users association I could easily become a member of this association if I wish	10	0.658
Tendency	A determination to act in a certain way	I tend to become a member of water user associations to improve my farm irrigation performance I tend to become a member of water user associations to help protect the regional water resources	9	0.862
Behavior	The way in which one acts or conducts oneself, especially towards others	Considering all these issues, I will soon become a member of water user associations in order to improve agricultural water management After my membership, I will encourage other farmers to become a member of water user associations	2	0.722
Awareness of principles of cooperation and WUAs	Knowledge about cooperation and WUAs	I have the required knowledge and information for becoming a member in this association I am Familiar with formation method of a water user associations I am aware with the required management skills for establishing and governing water user associations	7	0.922

A panel of experts consisting of faculty members of Agricultural Extension and Education Department at Tarbiat Modares University, Department of Rural Development at Yasuj University, and social researchers at the Moshaver-e Mahab Qods Consultation Institute reviewed both instrument for content and face validity. The instruments were then pilot with 30 farmers in Shushtar Township, Khuzestan Province. Pilot tested the research instrument resulting in a Cronbach's alpha ranged from 0.658 to 0.922. Results showed an appropriate internal consistency among the items of each scale (Table 1). Descriptive and inferential statistical tools like frequencies, percentage, mean scores, standard deviation, coefficient of variance (CV) and multiple regression as a mediation test to path analysis were used to analyze the data. Path analysis can be viewed as an extension of multiple regressions. With multiple regressions, a researcher can predict the dependent variable. However, a path analysis can be used for predictive ordering of variables (Malek Saeidi *et al*., 2012). In this research, path analysis was used to determine the direct and indirect effects of independent variables (awareness of the principles of cooperation and WUAs, attitude, subjective norms, perceived behavioral control and tendency) on the dependent variable (behavior). The model for independent variables and behavior of membership in WUAs (Fig. 2) was used as a cause and effect chain to work out a path analysis. Data were analyzed using Statistical Package for the Social Sciences (SPSS 19). However, a part of path analysis was carried out without any software (Kalantari, 2006).

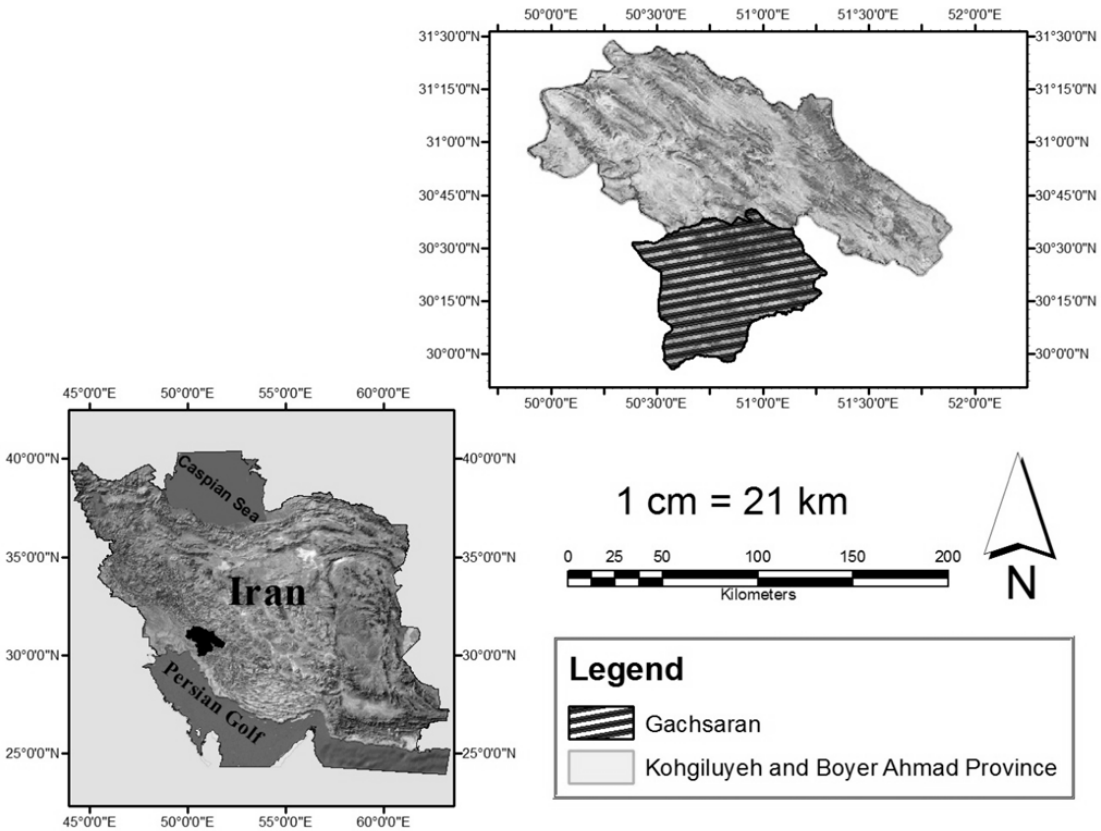

Figure 3. Geographic location of the research area

The study area

The study area, Lishter irrigation and drainage network, is located in 20 km in west of Gachsaran county in Kohgiluyeh and Boyer Ahmad province, a southwest province of Iran, at 50˚23′

E to 50°38′ E longitude and 30°23′ N to 30°35′ N latitude (Fig. 3). The research area covers 4347 hectares of land area and is located in runoff of Kowsar dam. Development of irrigation of Lishter plain lands are the goals of Lishter irrigation and drainage network. In addition to provide drinking water needs, the Kowsar dam provided approximately 100 million cubic meters of water for agricultural development in Lishter plains. In the same path, an increase in agricultural and livestock production, job creation and national and regional infrastructure toward sustainable development were the objectives of this project. There were 572 farmers living in 14 rural locations and all were involved in farming practices. Most of the farmers owned their own farming lands. About 59% of farmers used sprinkler irrigation method, 13% dripping irrigation and 28% use surface method. The network irrigation system not only has directly improved the livelihood of the farmers in the region, but also changed the social and economical situations of the far region, indirectly.

Results and Discussion

Socio and demographic characteristics

Average age of the farmers was 44.12 years, ranging from 22 to 83, with median 44 and mode 48. The average experience of farmers was 19 years, ranging from 2 to 59 years. The education profile showed that 12.3% of the farmers were illiterate and the rest had reading and writing knowledge or higher. Farming is the only job for about 50% of farmers. More than 50% of farmers (51.1%) did not participate in agricultural extension training regarding establishing WUAs. Further, 60% of farmers used new irrigation method (sprinkler irrigation and drip irrigation) (Table 2). 73.4% of these farmers were members of the region's rural production cooperative and 14% were not members of any associations.

Table 2. Personal and professional characteristics of farmers (n=219)

Variable	Category	Frequency	Percentage
Age (year)	<30	35	16.00
	30-40	53	24.20
	40-50	76	34.70
	>50	55	25.10
Educational level	Illiterate	27	12.3
	Reading and writing knowledge	64	29.2
	Junior high school	48	21.9
	Diploma	39	17.8
	Higher than diploma	41	18.7
Job	Farming	110	50.2
	Farming and livestock	77	35.2
	Farming, livestock and garden	32	14.6
Participation in agricultural extension courses	Yes	107	48.9
	No	112	51.1
Irrigation method	Surface	85	38.8
	Sprinkler irrigation	94	42.9
	Drip Irrigation	40	18.3

In order to compare and classify the main variables of the study, coefficient of variance for each variable was calculated. Farmers have a high mean score for behavior and attitude towards

establishing WUAs (Table 3). Awareness of principles of WUAs had a mean score of (M=2.89) and ranked lowest.

Table 3. Ranking of study variables based on chosen descriptive statistics

Variable	Mean*	Standard deviation	Coefficient of variance	Rank
Behavior	4.12	0.88	0.213	1
Attitude	4.00	0.97	0.242	2
Tendency	3.93	0.94	0.239	3
Subjective norms	3.79	1.01	0.266	4
Perceived behavioral control	3.62	1.09	0.301	5
Awareness of principles of cooperation and WUAs	2.89	1.35	0.467	6

*1: Strongly disagree, 2: Disagree, 3: Uncertain, 4: Agree, 5: Strongly agree

Correlation between demographic characteristics with tendency and behavior

Table 4 shows the results of correlation analysis between some important demographic characteristics with tendency and behavior toward membership in WUAs. Among these variables, only there was a significant and positive correlation between years of agricultural experiences with tendency and behavior at 0.01 alpha level. However, the variable of educational level had a significant and negative correlation with the tendency at 0.05 alpha level. In addition, there were a positive and significant difference between age and the number of family members with farmer's behavior toward membership in WUAs.

Table 4. Correlation matrix between demographic characteristics with tendency and behavior

Variable	Correlation coefficient for tendency	Correlation coefficient for behavior
Age	0.126	**0.186
Educational level	*-0.154	-0.031
Number of pieces of agricultural lands	0.051	0.041
Amount of agricultural land	0.074	0.075
Number of family members	0.105	**0.192
Agricultural experiences	**0.203	**0.237

****Correlation is significant at the 0.01 level

*Correlation is significant at the 0.05 level

Correlation between the Main Variables

Table 5 shows the results of correlation analysis between the main variables of the study. Farmers' attitude toward WUAs, subjective norms, perceived behavioral control, tendency toward membership in WUAs, and behavior are all significantly and positively correlated together at 0.01 level of significance. The variable of awareness was significantly correlated to subjective norms and the farmers' behavior toward membership in WUAs but not significantly correlated with the other three variables.

Table 5. Correlation matrix between different variables

Variable	Attitude	Subjective norms	Perceived behavioral control	Tendency	Behavior	Awareness
Attitude	1					
Subjective norms	0.533**	1				
Perceived behavioral control	0.550**	0.474**	1			
Tendency	0.498**	0.408**	0.546**	1		
Behavior	0.419**	0.558**	0.395**	0.612**	1	
Awareness	0.049	0.286**	-0.031	0.087	0.363**	1

** $p \leq 0.01$

Variables affecting farmer's behavior towards membership in WUAs

Figure 4 shows the causal mechanisms between the variables in the model and the farmers' behavior. The path coefficients showed that the direct effects of some variables on the others were not significant. Thus, in the final model these paths were discarded for a better understanding of the relations between independent and dependent variables.

Effect of the tendency towards WUAs on behavior as depicted in Table 6, indicates that farmer's tendency towards WUAs has the strongest direct influence on their behavior of membership in WUAs (0.566). This effect was significant at a 0.01 level based on a regression test (Figure 3). Table 4 shows that the correlation between tendency with behavior is significant (r= 0.612, P< 0.01). Therefore, farmers who have more tendencies toward WUAs make more efforts to become a member of WUAs. In other words, the more willing the farmers to improve the region's irrigation and irrigation efficiency, the more tendencies they had to become members of the WUAs. This result confirms the results of studies by Merikivi *et al*. (2010), O'Neill (2010), Forward (2010), Willock *et al*. (1999), and Austin *et al*. (2001).

Further, it was found that after farmers' tendency, perceived behavioral control had the highest total effect (0.290) on behavior, which was significant at 0.01 levels. This indicates that farmers with high perception about difficulties of WUAs have more attempts towards membership in WUAs. When the farmers are aware of the difficulties on the way to do something, they can more easily decide whether or not to do it. Table 5 shows that the correlation between perceived behavioral control and behavior is significant (r= 0.395, P< 0.01). Therefore, perceived behavioral control has direct and indirect effects on behavior. Most of its effect is indirectly via tendency toward WUAs (0.362) (Figure 4). Table 5 shows that the correlation between perceived behavioral control and tendency is significant (r= 0.546, P< 0.01). Therefore, farmers with high perception of difficulties of WUAs have more intention toward membership in these associations. In other words, an understanding of the ease or difficulty of membership in WUAs will not immediately result in membership, but first affects the farmers' tendency. This result confirms the results of studies by Barani *et al*. (2009), Afshar and Zarafshani (2010) and Azizi Khalkheiliand Zamani (2009), but is not in line with the results of Mehri *et al*. (2011). In their research in Doroodzan Dam Irrigation Network in Fars province, south of Iran, Azizi Khalkheili and Zamani (2009) found that problem perception is one of the six factors that influenced farmer's participation in irrigation management.

Subjective norms, is the third variable that had the highest total effect (0.270) on behavior, which was significant at the 0.01 level (Table 5). All of the effects of subjective norms on behavior are indirect via attitude toward WUAs and perceived behavioral control (Figure 4). Based on Table 5, the significant correlation between subjective norms and attitude (r= 0.533, P< 0.01) and

subjective norms and perceived behavioral control (r= 0.474, P< 0.01) emphasizes that more affects farmers from their family, progressive farmers and agricultural experts regarding membership in WUAs has a positive effect on attitude of farmers towards WUAs, and perception of membership difficulty in WUAs, thereby having an indirect and positive effect on behavior. In other words, farmers may first get others' viewpoints on becoming a member of WUAs and then change their attitude and behavior toward WUAs. On the other hand, in addition to collecting existing views on associations, farmers evaluate the associated difficulties and their self-efficacy and then decide whether or not to become a member of a WUA. Further, Table 5 shows a positive correlation between subjective norms and behavior (r= 0.558, P< 0.01). The finding of the present study with regard to the direct effect of attitude on tendency is in line with the findings of Toma and Mathjis (2005), Sserunkuuma *et al*. (2003), and Khorshidifar (2005).The more positive views farmers have of WUAs and their consequences, the more tendencies they have to acquire membership.

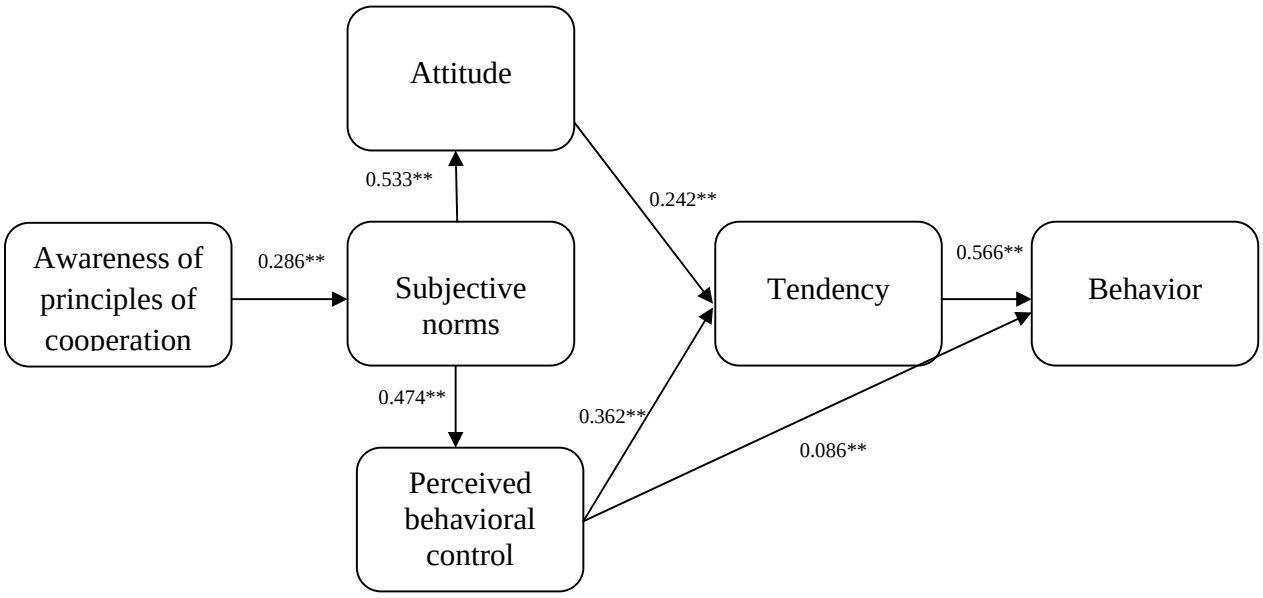

Figure 4. Path diagram of the variables influencing behavior of farmers for membership in WUAs
The path coefficients (numbers in figure) are linear and standardized (ß in regression model)
The significance of test is *p≤0.05 and **p≤0.01

One of our assumptions was that the variable awareness of principles of cooperation and WUAs would affect attitude toward WUAs as well as subjective norms and perceived behavioral control. However, results (Figure 4) indicate that only the route between awareness of principles of cooperation and WUAs, and subjective norms is significant at 0.01 levels (0.286). Based on the correlation matrix (Table 5), the correlation between awareness of cooperation principles and subjective norms is positive and significant (r= 0.286, P< 0.01). It means that an increase in the knowledge of farmers about cooperation and WUAs principles may lead to think better about others (family and relatives, other farmers, experts etc) ideas regarding membership in WUAs and evaluate the advantages and disadvantages of membership and decide whether or not to become a member of WUAs, thereby having an indirect and positive effect on behavior. Furthermore, Table 5 shows a positive correlation between awareness of principles of cooperation and WUAs, and behavior (r=

0.363, P< 0.01). This finding contradicts Lajunen and Rasanen's (2004) and Qiao *et al*. (2009) finding with regarding the effect of awareness on attitude and perceived behavioral control, but conforms with Solhi *et al*. (2012), Ghaemi *et al*. (2008), Khedri (2006) with regard to the effect of awareness on subjective norms. In Qiao *et al*. (2009) research in Inner Mongolia, high degree of understanding about WUAs is one of the six factors that influence farmer's inclination to join WUAS. Other factors including being a village cadre; good state of health; small proportion of household members in the labor force; cropping income as a high percentage of family income and having had previous conflicts regarding water use issues.

Table 6. Analysis of the effect of independent variables of study on farmers' behavior toward WUAs

Independent Variable	Direct Effect	Indirect Effect	Total Effect	Non-Causal Effect	Correlation Coefficient
Tendency	0.566	-	0.566	0.046	0.612
Perceived behavioral control	0.086	0.204	0.290	0.105	0.395
Subjective norms	-	0.270	0.270	0.288	0.558
Attitude	-	0.136	0.136	0.283	0.419
Awareness	-	0.072	0.072	0.302	0.363

Conclusions and Recommendations

Iran is an arid country and water is a limited resource for agricultural development in most areas of the country. The most important issue in water resources management is making equal between the supply and need for water. Since the supplying water is always limited and the need for water is constantly increasing due to growing population and increasing the quality of life, planning for efficiency use of water resources has become crucial. Keeping in mind the fact that more than 90% of extracted water is used in agriculture sector, using mechanisms to improve water resources management is a necessity (Soleymani *et al*., 2009).

Establishing WUAs is one of these mechanisms. Before establishing, understanding the farmer's tendency and behavior towards these associations is necessary. This research was conducted to investigate important factors affecting farmer's behavior of membership in WUAs.

Based on the findings from this study, the effects of selected independent variables on the behavior of membership in WUAs indicate that farmers with more tendencies towards the WUAs had a positive norm about membership in WUAs emphasizing the importance of farmer's tendency in establishing WUAs. The effect of perceived behavioral control indicated that farmers who have the correct understanding of the ease or difficulty of membership in WUAs and aware of their efficacy had a more tendency towards WUAs thereby making more attempts to become a member of WUAs.

The influence of subjective norms on behavior of membership in WUAs indirectly via attitude and perceived behavioral control indicates the role of farmer's family, progressive famers and agricultural experts in changing the farmer's attitude toward membership in WUAs and help them recognize the consequences of membership in WUAs. The significant correlation between numbers of family members with behavior (Table) is in line with this result, which indicated farmers with more family members have more willingness for becoming a member of WUAs. Then, it seemed that the extension programs for establishing WUAs should focus on the role of face-to-face meeting and visiting the performance of other progressive farmers regarding the WUAs. The

negative and significant relationship between educational level and tendency confirmed the role of face-to-face meeting in increasing the knowledge of the farmers and changing their attitude to join in WUAs. The farmers with high educational level have fewer tendencies toward membership in WUAs. Higher level of education causes farmers to reach the financial and non-financial resources and have less participation in corporation activities (for e.g. WUAs). In addition, there are positive and significant relationship between years of educational experiences and tendency and behavior of membership in WUAs. The farmers with more farming experiences are probably more traditional and have less educational level. Then, using individual method of contact was more effective than published materials such pamphlet and fact sheets in encouraging farmers to join WUAs.

The effects of subjective norms on tendency towards membership in WUAs were not confirmed by this study.

The knowledge of farmers about principles of cooperation and WUAs is another variable that influenced the farmer's behavior of membership in WUAs indirectly via subjective norms. Therefore, providing situations to farmers to acquire knowledge of WUAs should be a priority for education and extension organizations.

There are different factors (such as socioeconomic variables and demographic characteristics) that influence tendency and behavior of farmers towards membership in WUAs directly or indirectly through reciprocal actions. Further studies are recommended among farmers in other provinces or national level, as it is expected to provide considerable evidence regarding the role of other variables.

References

Abbasi, E., & M. Akbari (2011). A study of the clergies' tendency toward participating in agriculture and natural resources extension and education programs. J. Research on Economics and Agricultural Development of Iran, 42(3), 467-479.

Afshar, N., & K. Zarafshani (2010). An analysis of the tendency toward participating in water management: a case study of water users associations in the cities of Sefidbarg and Sarabbas, Kermanshah, Iran. The Iranian Journal of Agricultural Extension and Education, 2, 99-113.

Ajzen, I. (1991). The theory of planned behavior. Organizational behavior and human decision processes, 50(2), 179-211.

Ajzen, I. (2006). Icek Ajzen's Homepage: TPB diagram. Used with permission. Retrieved from http://www.people.umass.edu/aizen/tpb.diag.html

Ajzen, I., & M. Fishbein (1980). Understanding attitudes and predicting social behavior. englewood cliffs, NJ, Prentice-Hall.

Ajzen, I., & B.L. Driver (1992). Application of the theory of planned behavior to leisure choice. J. Leisure Research, 24, 207- 224.

Awan, U.K., Tischbein, B., Conrad, C., Martius, C., & M. Hafeez (2011). Remote sensing and hydrological measurements for irrigation performance assessments in a water user association in the lower Amu Darya river basin" Water Resource Management, 25, 2467–2485.

Azizi Khalkheili, T., & G.H. Zamani (2009). Farmer participation in irrigation management: The case of Doroodzan Dam Irrigation Network, Iran. Agricultural Water Management, 96, 859 – 865.

Bamberg, S. (2002). Implementation intention versus monetary incentive comparing the effects of interventions to promote the purchase of organically produced food. J. Economic Psychology, 23(5), 573-587.

Barani, S., Athari, Z., & K. Zarafshani (2009). An analysis of the tendency toward entrepreneurship in the students of agriculture at Elmi-Karbordi University: a case study of Kermanshah province, Iran. J. Entrepreneurship Development, 2(6), 95-73.

Beedell, J., & T. Rehman (2000). Using social-psychology models to understand farmers' conservation behavior. J. Rural Studies, 16, 117-127.

Berger, T., Birner, R., D´ıaz, J., McCarthy, N., & H. Wittmer (2007). Capturing the complexity of water uses and water users within a multi-agent framework. Water Resource Management, 21, 129–148.

Chiou, J. (2000). Antecedents and moderators of behavioral intention: Differences between US and Taiwanese students. Genetic, Social, and General Psychology Monographs, 126(1), 105-124.

Ehsani, M., & H. Khaledi (2003). Agricultural water productivity. Iranian National Committee on Irrigation and Drainage Press, Tehran, Iran.

Fortin, D.R. (2000). Clipping coupons in cyberspace: a proposed model of behavior for deal-prone consumers. Psychology and Marketing, 17(6), 515-534.

Ghaemi, F., Samsam Shariat, M. R., Asefvaziri, K., & D. Balochi (2008). The correlation between awareness and informative resources on addition and the tendency to drug abuse in the students at Islamic Azad University, Khorasgan Branch. Study and Research in Applied Psychology, 10(38), 93-104.

Ghalavand, S. (2006). Transferring watering channels management to non-governmental organizations IMT & WUA. Index of Articles on the 1st National Conference on Drainage and Watering Channels Management, Chamran University, May, 2-4.

Habeeb, M., Robert, J., Birkenholz, A., & R.W. Curtls (1987). Clientele group and extension council officer perceptions of the cooperative agricultural extension service. J. Agricultural Education, 28(4), 15- 20.

Hattam, C. (2006). Barriers to the adoption of organic agriculture an investigation using the Theory of Planned Behaviour. In: Atkinson, C.; Ball, B.; Davies, D. H. K.; Rees, R.; Russell, G.; Stockdale, E. A.; Watson, C. A.; Walker, R. and Younie, D. Eds., Aspects of Applied Biology 79, What will organic farming deliver, COR, 73.

Hayati, D., Ebrahimi, E., & K. Rezaee Moghadam (2010). The economic advantages of increasing people's participation in developing watering channels and drainage: A Case Study of Amir Gulf, Fars, Iran. Economy and Agricultural Extension, 24(3), 371-383.

Huang, Q., Wang, J., Easter, K. W., & S. Rozelle (2010). Empirical assessment of water management institutions in northern China. Agricultural Water Management, 98, 361–369.

Ingram, K.L., Cope, J.G., Harju, B.L., & K.L. Wuensch (2000). Applying to graduate school: A test of the theory of planned behavior. J. Social Behavior and Personality, 15(2), 215-226.

Kalantari, K. (2006). Data Processing and Analysis in Socio-Economic Research. Sharif Publication, Tehran, Iran.

Karami, E., & A. Mansoorabadi (2007). Sustainable agricultural attitudes and behaviors: a gender analysis of Iranian farmers. J. Environmental Sustainable Development, 10, 883-898.

Karppinen, H. (2005). Forest owners' choice of reforestation method: An application of the theory of planned behavior. Forest Policy and Economics, 7(3), 393- 409.

Kazbekov, J., Abdullaev, I., Manthrithilake, H., Qureshi, A., & K. Jumaboev (2009). Evaluating planning and delivery performance of water user associations (WUAs) in Osh Province, Kyrgyzstan. Agricultural Water Management, 96, 1259–1267.

Khedri, F. (2006). A study of operative factors in water users' participation in maintaining and expanding watering channels and drainage. Index of articles on the 1st national conference on drainage and watering channels management, Chamran University, May, 2-4.

Khorshidifar, J. (2005). Water users associations: the past, the present, and the future. The 4th Workshop on Farmers' Participation in Watering Channels and Drainage Management, Tehran, December, 29.

Krejcie, R.V., & D.W. Morgan (1970). Determining sample size for research activities. Educational and Psychological Measurement, 30, 607-610.

Lajunen, T., & M. Rasanen (2004). Can social psychological models be used to promote bicycle helmet use among teenagers a comparison of the health belief model, theory of planned behavior and the locus of control. J. Safety Research, 35(1), 115-123.

Malek Saeide, H., Rezaei-moghaddam, K., & A.A. Ajili (2012). Professionals' attitudes towards organic farming: the case of Iran. J. Agricultural Science and Technology (JAST), 14, 37-50.

Meinzen-Dick, R. S. & R. Pradhan (2001). Implications of Legal Pluralism for Natural Resource Management. General & Introductory Development Studies, 32 (4), 10–17. DOI: 10.1111/j.1759-5436.2001.mp32004002.x

Ministry of cooperative-labor and social welfare. (2001). Statistics and information center. cooperatives affairs, Tehran, Iran.

Norouzi, O. (2005). A study of operative factors in wheat growers' knowledge, attitude, and skills in water management. M.S. Thesis, Tarbiat Modares Univ., Tehran, Iran.

Omid, M. H., Akbari, A., Zarafshani, K., Gholam Hassan, E., & H. Shabanali Fami (2012). Factors influencing the success of water user associations in Iran: a case of Moqan, Tajan, and Varamin. J. Agricultural Science and Technology (JAST), 14, 27-36.

Pouta, E., & M. Rekola (2001). The theory of planned behavior in predicting willingness to pay for abatement of forest regeneration. Society and Natural Resources, 14(2), 93-106.

Qiao, G., Zhao, L., & K.K. Klein (2009). Water user associations in Inner Mongolia: factors that influence farmers to join. Agricultural Water Management, 96, 822–830.

Rehman, T., McKemey, K., Margaret, Y. C., Cooke, R. J., Garforth, C., Tranter, R., Park, J., & P. Dorward (2007). Identifying and understanding factors influencing the uptake of new technologies on dairy farms in SW England using the theory of reasoned action. Agricultural Systems, 94(2), 281-293.

Soleymani, M. M., Sayyar Irani, K., Sabbaqi, M. M., & M. Faridi (2009). The necessity for the optimization of agricultural water usage and the change of water management from governmental bodies to the private section. Index of Articles of 12th Conference of the National Committee of Watering Channels and Drainage, the Challenges and the Perspectives, Tehran, February, 24-25.

Solhi, M., Zinat motlagh, F., Karimzadeh Shirazi, K., Taghdisi, M. H., & F. Jalilian (2012) Planning and executing the educational program for increasing physical practice among students: An application of the theory of planned behavior. Quarterly of the University of Medical Sciences and Sanitary and Therapeutic Services at Gonabad, 18(1), 45-53.

Sserunkuuma, D., Ochom, N., & H. Ainembabazi (2003). Collective action in canal irrigation systems management: the case of doho rice scheme in Uganda. Department of Agricultural Economics and Agribusiness, Makerere University.

Toma, L., & E. Mathijs (2005). Determinants of Romanian farmers' participation in agri-environmental programs. Contributed paper, The XIth International Congress of the European Association of Agricultural Economists, Copenhagen, Denmark, August, 24-27.

Uysal, Ö, K., & E. AtIs (2010). Assessing the performance of participatory irrigation management over time: A case study from Turkey. Agricultural Water Management, 97(7):1017-1025.

Vermillion, D.L., & J.L. Sagardoy (1999). Transfer of irrigation management services: guidelines, food and agriculture organization of the United Nations. FAO Irrigation and Drainage, Rome, Paper 58.